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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,906	09/29/2003	Peter Bier	PO-7877/LcA 35,784	1986
157	7590	12/01/2005	EXAMINER	
BAYER MATERIAL SCIENCE LLC 100 BAYER ROAD PITTSBURGH, PA 15205			FEELY, MICHAEL J	
			ART UNIT	PAPER NUMBER
			1712	

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,906

Applicant(s)

BIER ET AL.

Examiner

Michael J. Feely

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0903.0304.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 8-24, 27, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Mennig et al. (WO 01/30922). All citations in the following rejections are directed towards the English equivalent of this WIPO document (US Pat. No. 6,855,396).

Regarding claims 1-5 and 8-22, Mennig et al. disclose: *(1)* a multilayered article comprising:

- (1) a substrate (S) (Abstract; column 11, lines 12-30);
- (2) a scratch resistant layer (SR) prepared by curing a scratch-resistant coating composition comprising a polycondensate prepared from at least one silane, said polycondensate being prepared by a sol-gel process (Abstract; column 2, line 29 through column 3, line 36); and
- (3) a top layer (T) prepared by curing a top layer coating composition prepared by hydrolyzing a composition comprising: (a) at least one compound $M(R')_m$ (I) wherein M is an element selected from the group consisting of Si, Ti, Zr, Sn, Ce, Al, B, Vo, In and Zn, R' represents a hydrolysable radical, and m is an integer from 2 to 4; and (b) optionally at least one

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compound $R_bSiR'_a$ (II) wherein the radicals R' and R are the same or different, R' is as defined for general formula (I), R represents a group selected from an alkyl group, an alkenyl group, an aryl group, a hydrocarbon group with at least one halogen group, an epoxide group, a glycidyl group, an amino group, a mercapto group, a methacryloxy group and a cyano group, and a and b independently of one another have a value from 1 to 3, provided that the sum of a and b is four (Abstract; column 7, line 63 through column 11, line 12; Examples 1-5);

wherein said scratch-resistant layer is interposed between said substrate and said top layer (Abstract; column 11, line 13 through column 12, line 63);

(2) wherein said substrate comprises a plastic (column 11, lines 13-30);

(3) wherein the polycondensate of the scratch resistant coating composition is prepared from methyl-silane (column 3, lines 25-58);

(4) wherein the polycondensate of the scratch-resistant coating composition is prepared from a composition comprising 10 to 70 wt% silica sol, and 30 to 90 wt% of a partially condensed organoalkoxysilane, in a solvent mixture comprising at least one aqueous solvent and organic solvent (column 2, lines 29-44; column 6, lines 42-60);

(5) wherein the polycondensate of the scratch-resistant coating composition is prepared from at least one silyl acrylate (column 4, lines 5-21);

(8) wherein the hydrolysis of the composition of the top layer coating composition is conducted in the presence of at least 0.6 mol of water, based on 1 mol of hydrolysable radicals R' (Examples 1-5);

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(9) wherein during hydrolysis of the composition of the top layer coating composition, the compound of formula (II) is present in an amount of less than 0.7 mol, based on 1 mol of the compound of formula I (Examples 1-5);

(10) wherein the hydrolysis of the composition of the top layer coating composition is conducted at a pH of less than 6.0 (Examples 1-5);

(11) wherein the solids content of the top layer coating composition is 0.2 to 15 wt% (Examples 1-5);

(12) wherein the hydrolysis of the composition of the top layer coating composition is conducted in the presence of a solvent selected from at least one of water, an alcohol having a boiling point below 120°C and an alkoxy-alcohol (Examples 1-5);

(13) wherein M of formula (I) is selected from the group consisting of Si, Ti, Zr, Sn and Ce, and m is 4 (Examples 1-5; column 8, lines 1-31);

(14) wherein M of formula (I) is selected from the group consisting of Al, B, V and In, and m is 3 (Examples 1-5; column 8, lines 1-31);

(15) wherein M of formula (I) is Zn, and m is 2 (Examples 1-5; column 8, lines 1-31);

(16) wherein the hydrolysable radical R' of formulas (I) and (II) is selected from the group consisting of halogens, C₁₋₄ alkoxy, C₆₋₁₀ aryloxy, C₁₋₄ acyloxy and alkylcarbonyl (Examples 1-5);

(17) wherein formula (I) is selected from at least one tetraalkoxysilane (Examples 1-5);

(18) wherein formula (II) is selected from at least one of glycidyoxy-propyl-tri-methoxy-silane, methyltriethoxysilane and methacryloxy-propyl-trimethoxysilane (column 9, line 24 through column 10, line 19);

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(19) wherein after completion of the hydrolysis of the composition of the top layer coating composition a hydrolysis product is formed and, at least one of: (a) at least one additive selected from the group consisting of flow control agents, dyestuffs, stabilizers and inorganic fillers is added to the hydrolysis product; and (b) the concentration of the hydrolysis product is adjusted to 0.02 to 15 wt% by adding at least one of alcohols and alkoxy-alcohols to the hydrolysis product (column 10, lines 57-61; column 6, lines 32-60);

(20) wherein the scratch-resistant layer has a thickness of 0.5 to 30 microns (column 11, lines 39-49);

(21) wherein the top layer has a thickness of 0.1 to 3.0 microns (column 11, lines 39-49);
and

(22) further comprising a primer layer (P) interposed between said substrate and said scratch-resistant layer (column 11, lines 31-38).

Regarding claims 23, 24, 27, and 28, Mennig et al. disclose: (23) a process of preparing a multilayered article comprising the following steps:

- (a) providing a substrate (S) (Abstract; column 11, lines 12-30);
- (b) forming a scratch resistant layer (SR) by applying a scratch-resistant coating composition to a surface of said substrate, and partially curing the applied scratch-resistant coating composition comprising a polycondensate prepared from at least one silane, said polycondensate being prepared by a sol-gel process (Abstract; column 2, line 29 through column 3, line 36; column 11, line 58 through column 12, line 63);

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(c) forming a top layer (T) by applying a top layer coating composition to the scratch-resistant layer, said top layer coating composition being prepared by hydrolyzing a composition comprising: (a) at least one compound $M(R')_m$ (I) wherein M is an element selected from the group consisting of Si, Ti, Zr, Sn, Ce, Al, B, Vo, In and Zn, R' represents a hydrolysable radical, and m is an integer from 2 to 4; and (b) optionally at least one compound $R_bSiR'_a$ (II) wherein the radicals R' and R are the same or different, R' is as defined for general formula (I), R represents a group selected from an alkyl group, an alkenyl group, an aryl group, a hydrocarbon group with at least one halogen group, an epoxide group, a glycidyloxy group, an amino group, a mercapto group, a methacryloxy group and a cyano group, and a and b independently of one another have a value from 1 to 3, provided that the sum of a and b is four (Abstract; column 7, line 63 through column 11, line 12; Examples 1-5; column 11, line 58 through column 12, line 63); and

(d) curing said scratch-resistant and top layers (Abstract; column 11, line 13 through column 12, line 63);

(24) further comprising drying the scratch resistant-layer at a temperature of greater than 110°C, after the application of the scratch-resistant coating composition to said substrate (column 11, line 58 through column 12, line 6); (27) further comprising, curing the scratch-resistant layer, activating the cured scratch resistant layer by applying at least one of a corona treatment and a flame treatment to a surface of the cured scratch-resistant layer, and applying said top layer coating to the activated scratch-resistant layer (column 12, lines 7-11); and (28) further comprising, applying a primer layer (P) to the substrate, and applying the scratch-resistant coating composition to the primer layer (column 11, lines 31-38).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 6, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mennig et al. (WO 01/30922).

Regarding claims 6, Mennig et al. explicitly disclose the use of methacryloxypropyl-trimethoxysilane and AlO(OH) nanoparticles in their top layer (column 8, lines 25-31; column 9, line 1 through column 10, line 19); however, they do not explicitly disclose the use of these materials in their scratch-resistant layer. Rather, they disclose, "Additionally, additives known in the filed of coatings technology may be added to the (hard base layer) coating composition based on the compounds which are polymerizable or curable thermally or photochemically to form a polymer. Examples of such additives include solvents, crosslinking agents, lubricants, *nano-scale particulate solids*, polymerization initiators, photosensitizers or *leveling agents*...for the

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nano-scale particulate solids that can be used, reference may be made to the description below,”
(column 6, lines 32-41).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use $\text{AlO}(\text{OH})$ nanoparticles treated with methacryloxypropyl-trimethoxysilane in the scratch-resistant layer of Mennig et al. because Mennig teaches the use of these materials in their top coat and contemplates the use of these same materials as additives in their scratch-resistant layer.

Regarding claim 25, Mennig et al. use a leveling agent in their scratch-resistant coating (column 6, lines 32-41) which qualifies as a *flow-control agent*; however, they are silent regarding the amount of this leveling agent.

It should be firstly noted that applicant fails to show criticality for this range. Secondly, the skilled artisan would have recognized that the amount of this leveling (flow control) agent is a result effective variable, wherein an effective amount is required to achieve the desired leveling (flow control) modification.

In light of this, it has been found that, “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation,” – *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955); and, “A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation,” – *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use 0.01 to 3.0 wt% of leveling (flow control) agent in the scratch resistant composition of Mennig et al. because it has been found that where the general conditions of a result effective variable are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.

Regarding claim 26, adjusting the humidity in an effort to modify and/or optimize the curing process would have been obvious to the skilled artisan due to the hydrolysis/condensation nature of the curing reaction, which requires the presence of moisture (water) to proceed. The claimed humidity level of 50 to 75% RH overlaps with what would be considered ambient humidity conditions to the skilled artisan. Furthermore, with the lack of any specific teaching of humidity in the prior art, ambient humidity would have been an obvious choice to perform this curing process.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the relative humidity to 50 to 75% RH during the curing step of Mennig et al. because the claimed range overlaps with standard ambient conditions. Furthermore, any modification of humidity would have been obvious to the skilled artisan because the hydrolysis/condensation nature of the curing mechanism requires moisture (water) to proceed. Such a modification would merely represent the optimization of a result-effective variable.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mennig et al. (WO 01/30922) in view of Mager et al. (US Pat. No. 6,673,458).

Regarding claim 7, Mennig et al. are as set forth above and incorporated herein. Mennig et al. are silent regarding the use of at least one multifunctional cyclic organosiloxane in the preparation of the polycondensate of the scratch-resistant coating.

Mager et al. disclose a method of converting a sol-gel condensate with a polyfunctional organosilane (Abstract), preferably cyclic carbosilanes featuring siloxane bonds (column 2, line 66 through column 3, line 16). This conversion is advantageous because it allows for the addition of organic solvents to the silica sol condensates without segregation of the aqueous silica-sol taking place (column 4, line 60 through column 5, line 11). In light of the use of organic solvents in Mennig et al., it would appear that the use of these cyclic organosiloxanes would have also been useful in the sol-gel polycondensate of the scratch-resistant layer of Mennig et al.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use multifunctional cyclic organosiloxane, as taught by Mager et al. in the preparation of the polycondensate of the scratch-resistant coating of Mennig et al. because Mager et al. disclose a conversion process of a sol-gel condensate using these multifunctional cyclic organosiloxanes, which is advantageous because it allows for the addition of organic solvents to the silica sol condensates without segregation of the aqueous silica-sol taking place.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application

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claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-9 and 11-28 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-31 of copending Application No. 10/673,960 (US 2004/0131793). Although the conflicting claims are not identical, they are not patentably distinct from each other because: (a) the combined limitations of copending claims 1, 23, and 31 are encompassed by the broader limitations of instant independent claim 1; (b) the combined limitations of copending claims 1 and 23 are encompassed by the broader limitations of instant independent claim 23; and (c) the limitations of the copending dependent claims correspond to or are encompassed by the limitations of the instant dependent claims 2-9, 11-22, and 24-28.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Edelmann et al. (US Pat. No. 6,699,586) and Cano et al. (US Pat. No. 6,051,310) are related; however, they do not teach or suggest the limitations of the instant claims.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is 571-272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael J. Feely
Primary Examiner
Art Unit 1712

November 28, 2005

**MICHAEL FEELY
PRIMARY EXAMINER**